Characterization of drug poisonings registered in a toxicological information center of Piauí from 2007 to 2012

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RESEARCH

Characterization of drug poisonings registered in a toxicological information center of Piauí from 2007 to 2012

Caracterização das intoxicações medicamentosas registradas no centro de informações toxicológicas do Piauí no período de 2007 a 2012

Caracterización de las intoxicaciones por medicamentos registrados en el centro de informaciones toxicológicas de Piauí en período de 2007 a 2012

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ABSTRACT
Objective: To characterize the profile of drug poisoning reported in a Toxicological Information Center of Piauí in the period from 2007 to 2012. **Method:** Data were collected through questionnaires of the National Poisoning Information System, through the analysis of the records of drug intoxication reported in the period 2007-2012by the Toxicological Information Center of Piauí and were analyzed using the programs Microsoft Excel 2007 and GraphPad Prism 5. **Results:** There were 503 drug poisonings, which were more frequent in females, children and young adults in urban areas. Individual accidents and suicide attempts were the mains causes and benzodiazepines were the most common drugs. Conclusion: The data found in this study are consistent with results from other Brazilian studies onthe subject. **Descriptors:** Poison, Drug, Public Health, Toxicology

RESUMO
Objetivo: Caracterizar o perfil das intoxicações medicamentosas registradas no Centro de Informações Toxicológicasdo Piauí no período de 2007 a 2012. **Método:** Os dados foram coletados por meio de formulários do Sistema Nacional de Informações Tóxico-Farmacológicas, através da análise das fichas de intoxicação medicamentosas notificadas no período de 2007 a 2012 pelo Centro de Informações Toxicológicas do Piauí e foram analisados utilizando os programas Microsoft Excel 2007 e GraphPad Prism 5. **Resultados:** Foram identificadas 503 intoxicações medicamentosas, as quais foram mais frequentes no sexo feminino, em crianças e adultos jovens de zona urbana, tendo como causas principais os acidentes individuais e as tentativas de suicídio e o os benzodiazepínicos forma as drogas mais utilizadas. **Conclusão:** Os dados encontrados no estudo são consistentes com os resultados de outros estudos brasileiros existentes sobre o tema. **Descritores:** Intoxicações, Medicamentos, Saúde Pública, Toxicologia.

RESUMEN
Objetivo: Caracterizar el perfil de las intoxicaciones por drogas notificadas en Centro de Información Toxicológica de Piauí, en el período de 2007 a 2012. **Método:** Los datos fueron recolectados a través de cuestionarios de Sistema Nacional de Información Fármaco-toxicológicas a través del análisis de los registros de intoxicación por drogas reportados en el período 2007-2012 por el Centro de Información Toxicológica de Piauí y se analizaron utilizando el Microsoft Excel 2007 y GraphPad Prism 5. **Resultados:** Hubo 503 intoxicaciones de drogas, que fueron más frecuentes en las mujeres, en niños y adultos jóvenes en las zonas urbanas, las principales causas fueron los accidentes individuales y los intentos de suicidio y las benzodiacepinas como las drogas más comunes. **Conclusión:** Los datos encontrados en este estudio son consistentes con los resultados de otros estudios brasileños sobre el tema. **Descriptores:** Intoxicación, Medicamentos, Salud Publica, Toxicología

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INTRODUCTION

The benefits provided by medicines are numerous because they promote healing, prolong life and delay the onset of complications associated with disease, enabling the patient to live better with their disease.[1,2] Thus, medicines are powerful weapons for slowing human suffering. [1-2] However, in spite of the most diverse benefits, medicines can be extremely harmful, seen that the unnecessary use of medicines, as well as use it in contraindicated situations causes people to be exposed to the risk of adverse drug reactions and intoxications. [1,2]

The existence of a wide variety of drugs in Brazil and in the world, favors the emergence of problems which represent a challenge to public health. [1,3] According to several authors, medicines occupy the first place in accidents resulting from exposure to toxic agents, being that the indiscriminate use of drugs one of the main factors responsible for important poisonings, fueled by information dubious quality and lack of interaction among health professionals. [1,3]

In Brazil, the National Toxic and Pharmacological Information - SINITOX - created in 1980 and linked the Oswaldo Cruz Foundation - FIOCRUZ - is responsible for the collection, compilation, analysis and dissemination of cases of intoxication and poisoning from the National Network of Information Centers and Toxicological Assistance - RENACIAT, currently consists of 36 units and is located in 19 states including the Federal District, which have the task of providing information and guidance on the diagnosis, prognosis, treatment and prevention of poisoning, as well as on the toxicity of chemical and biological substances and the risks they cause to health.[4,5] According to SINITOX medications are the main causative agents of poisonings in Brazil, ranking first in the statistics since 1994. It is estimated that about one-third of hospital admissions in the country originate from the incorrect use of medicines and drugs account for 27% of poisonings in Brazil and 16% of causes of death by poisoning. [4,6]

In this context, the present study aimed to understand the profile of the medication poisonings recorded in the Toxicology Information Center of Piauí (CITOX) in the period 2007-2012, in order to see which populations are most affected, as well as the circumstances in which these poisonings occur and the classes of drugs most used and compare them with results of existing studies on the topic. Thus, it is expected that collaborate with the adoption of measures for education and information from the public and health professionals on the importance and necessity of rational use of medicines.

METHODOLOGY

This is a cross-sectional, retrospective, a quantitative, exploratory and descriptive study, of all cases of human poisoning by medications reported in the Toxicology Information Center of Piauí (CITOX) in the period 2007-2012. Data were collected through the reporting forms of the National Toxic and Pharmacological Information (SINITOX) of the Ministry of Health The studied variables comprised the characteristics of the affected people, events and toxic agents.

In relation to the affected individuals were analyzed the gender (male and female) and age,

distributed in age range (<1 year, 1-4 years, 5-9 years, 10- 14 years, 15-19 years, 20-29 years, 30-39 years, 40-49 years, 50-59 years, 60 years or more).

Regarding the characteristics of the events it was considered the circumstances of poisonings: individual accident, collective accident, therapeutic use, inappropriate prescription, misuse, administration error, self-medication, attempted suicide, attempted murder, attempted abortion and ignored circumstance. Also analyzed were the areas of occurrence of poisoning, dividing them into rural area, urban area and ignored area. During the data collection phase, it was observed that many of the connectors were fulfilled improperly in the item concerning the evolution of poisoning, so that the item in question was not considered in the data analysis.

The toxic agents (medicines) were grouped according to their primary therapeutic use in the following classes: benzodiazepines, anticonvulsants, antidepressants, neuroleptics, anti-inflammatories, supplemented using multivitamins, antibiotics, anti-histamines, cardiovascular drugs, antiparasitic, bronchodilators, appetite stimulants, fenfluramine, contraceptives, analgesics, other and ignored. All data were processed electronically, tabulated and used for the preparation of charts and tables through the programs Microsoft Excel 2007 and Graphpad Prism 5.

This work was carried out through approval by the Research Ethics Committee of the University Center UNINOVAFAPI, Certificate of Presentation in Appreciation for Ethics (CAAE) 0404.0.043.000 -11.

RESULTS AND DISCUSSION

In Toxicological Information Center of Piauí (CITOX - PI), were recorded in the period 2007-2012, 503 medication poisonings. However, it is believed that these values are underestimated, given that a good part of the Piauí population, including health professionals, does not have knowledge of the services provided by CITOX.

The analysis in relation to food, through Figure 1, shows the predominance of drug intoxication in females when compared to males. From 503 reported poisonings, 280 (55.67%) affected women and 206 (40.95%) as shown in Figure 1. The individuals who appear in category Ignored are those whose forms were not filled out in the fields relating to name and/or gender.

According to Morais, one of the explanations of this fact stems from the habit of women self-medicate more than men, as well as the greater tendency of those in practice the home storage of medicines. [7] In addition, women have a greater concern with health and seek health services more than men, and consequently, use a greater quantity of medicines.[8] The preponderance of females in this study corroborates with similar studies on the topic. [7,11]

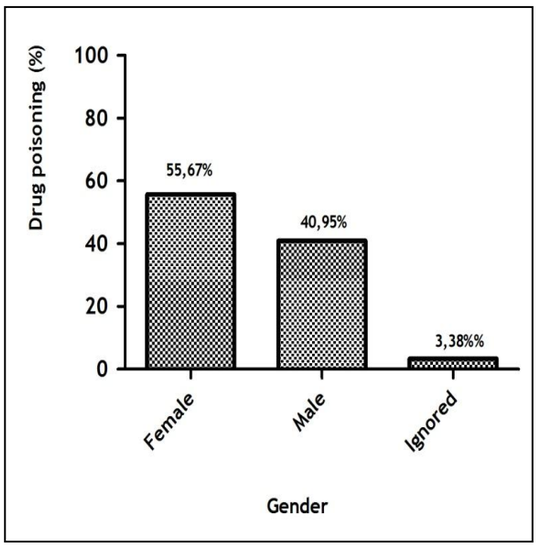

Figure 1: Characterization of drug poisoning reported in CITOX - PI in the period from 2007 to 2012, according to the gender of the affected population. Teresina, Piauí, 2013.

Table 1 shows the characterization of poisonings according to age of the affected population. The data represent the absolute values and percentages of notifications registered over the six years of study. It is observed that the poisonings are much more frequent in childhood in the age groups of 1-4 years and 5-9 years, and in young adults, the age groups of 20-29 and 30-39 years. Thus, the study showed that the drug intoxication occur more frequently in children and young adults, as recorded in Table 1.

The slower metabolism of some drugs by children, associated with the administration of overdoses seem to have implications in this fact. [7,12] However, the individual household accidents seem to be the main factors, since the Brazilian population has the habit of keeping a "household pharmaceuticals", many times, leaving the medicines within the reach of children, causing accidents that can be fatal. [9-12] the other age group greatly affected in relation to drug intoxication are young adults, between 20 and 40 years of age. J. res.: fundam. care. online 2013. dec. 5(6):55-63

Self-medication is without doubt one of the leading factors for this, however, in recent years, attempts to commit suicide in this age group is growing at alarming rates and may not be kept out of the analysis of drug poisoning causes. [2,7,10] This draws attention to the socio-economic impact of such injuries, considering they are ages corresponding to the peak of the productive human life[2,7,10]. The predominance of drug intoxication in children and young adults observed in this study confirms the trend observed in other Brazilian studies and national data.

Table 1 - Characterization of drug poisoning reported in CITOX / PI in the period from 2007 to 2012, according to the age group of the affected population. Teresina, Piauí, 2013.

Age Group	N	%
< 1 year	19	3.78%
1 - 4 years	141	28.03%
5 - 9 years	58	11.53%
10 - 14 years	32	6.36%
15 - 19 years	49	9.74%
20 - 29 years	77	15.31%
30 - 39 years	51	10.14%
40 - 49 years	21	4.17%
50 - 59 years	16	3.18%
> 60 years	14	2.78%
Ignored	25	4.97%
Total	503	100%

Source: Direct Survey 2013

Table 2 shows the characterization of poisonings according to the circumstances of occurrence. The data represent the absolute values and percentages of notifications registered over the six years of study. The poisonings per individual accident were predominant, accounting for 214 (42.54 %). As the second most prevalent occurrence is the suicide attempts, with 158 occurrences totaling 31.41% of the notifications.

The supply of over the counter medicines associated with the practice of self-medication can lead to improper use of medicines and facilitate the occurrence of such accidents. [2.13] Allied to the problems of individual accidents totals the number of people who use drugs to attempts acts of suicide. This problem is not restricted to Brazil, which presents official rate of suicide of approximately 4.1 per 100,000 inhabitants, compared with 16 per 100,000 inhabitants in level. [14] Suicide attempts in the study accounted for 31.41% of the notifications, as can be observed in Table 2. However, it is known that in reality the number of suicide attempts is under-reported due to the assessment of the amount of poisoning cases be calculated based on data provided by the National Toxic and Pharmacological Information (SINITOX) which, despite being a reference system for Latin America still suffers from significant underreporting due to no mandatory registration and lack of data uniformity regarding instances, data are often underestimated.

The literature reports that the number of suicide attempts are higher among women, but the consummation of suicide occurs more among men, they attempt in more forceful ways.[7.14]The predominance of women in suicide attempts is highlighted in the literature as being related to a higher rate of depression in this gender. [2,7,14] Associated to this, on the occasion of suicide attempts, women use more medicines, while men prefer to use pesticides.[8.14] Even with the second place among the main causes of poisoning, suicide attempts deserve special attention from public policies, because they directly reflect in morbidity and economy of the population, because extra expenses are generated for the health system and great part of the patients that use of self-intoxication repeat the act before being successful.

Table 2 - Characterization of drug poisoning reported in CITOX / PI in the period from 2007 to 2012, according to the circumstance from the event. Teresina, Piauí, 2013.

Circumstance	N	%
Individual Accident	214	42.54%
Suicide Attempt	158	31.41%
Therapeutic Use	55	10.93%
Administration Error	22	4.37%
Self-Medication	17	3.38%
Improper Use	8	1.59%
Inadequate medical Prescriptions	5	1.00%
Collective Accident	2	0.40%
Suicide Attempt	2	0.40%
Homicide Attempt	1	0.20%
Ignored	19	3.78%
Total	503	100%

Source: Direct Survey 2013

Figure 2 represents the occurrence areas of the poisonings. The values express the percentage of notifications recorded over the six years of study. As seen in the figure, the poisonings occurred in the urban area (89.27%) prevailed in relation to rural area (7.95%).

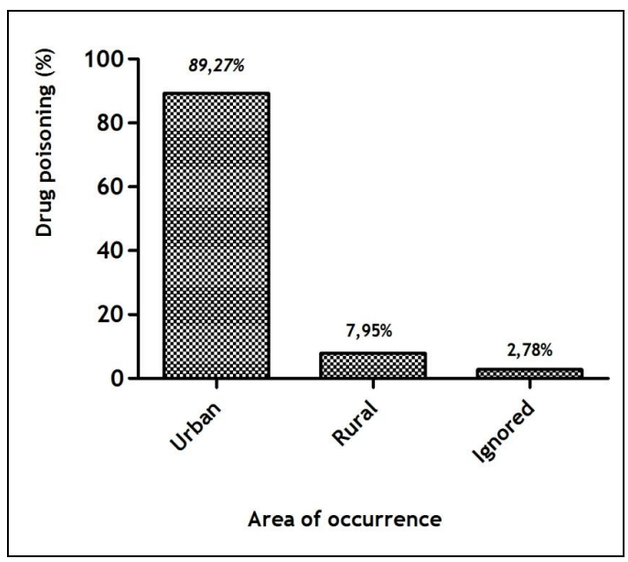

Figure 2: Characterization of drug poisoning reported in CITOX - PI in the period from 2007 to 2012, according to the area of occurrence. Teresina, Piauí, 2013.

By analyzing Figure 2, it is observed that individuals in the urban area poison themselves with medications more often, compared to individuals in rural areas, so that drug intoxication may be considered a typically urban injury.[7.15] This fact is probably due to a higher density of pharmacies in the cities, which collaborates for greater ease of access to medicines and self-medication, quite common practice in our midst.[7] The predominance of drug intoxication in the urban area in comparison to the rural area only confirms information from national data and Brazilian studies. [4,7,15]

In spite of all the tools that it offers, the CITOX-PI is faced with a big problem. Many times, after the resolution of the problem, it is not possible to maintain contact with the victim or those who log the connections looking for medical help. This brings in some of the cases, the incomplete information regarding the state of intoxicated, hindering the evolution assessment and monitoring of the victim. To resolve this type of problem, it is necessary to have a greater awareness of the population that uses the center in granting all information pertinent to the victims, in addition to maintaining contact with physicians to undertake the development of the patient. Only thus can we improve the information collected by doctors and academics with regard to the cases of cure, sequelae, or even death, avoiding information (who often are put in notification forms) of the type "cure not confirmed" or "evolution ignored", which were observed during the analysis of the records and made the analysis of the evolution impossible for the reported cases.

Table 3 shows the pharmacological groups involved in poisonings, evidencing the total of cases in which there is a single pharmacological group involved and the cases in which the pharmacological groups appear in association with other groups. There were 503 poisonings reported, of which 93 corresponded to medicine associations between distinct drug groups. The remaining 410 poisonings, 390 involved only one pharmacological group. The remaining 20 poisonings correspond to ignored group in the table, because in such cases, due to inadequate filling of the forms it was not possible to identify the drug. Thus, drug associations corresponded 18.49% of poisoning and the poisoning with a pharmacological group corresponded to 77.53%. The item "other" refers to various pharmacological groups that appeared in a smaller proportion in the notification forms.

Table 3: Characterization of drug poisoning reported in CITOX - PI in the period from 2007 to 2012, according to the gender of the affected population. Teresina, Piauí, 2013.

Group Pharmacological	No. of cases where there is a single pharmacological group involved (N =390)	%[1]	No. of cases where the pharmacological group appears in association with other groups (N =93)[2]	%[3]
Benzodiazepines	88	17.5%	52	55.91%
Anticonvulsants	48	9.54%	33	35.48%
Neuroleptics	27	5.37%	15	16.12%
Antidepressants	27	5.37%	21	22.58%
Anti-inflammatories	25	4.97%	14	15.05%
Multivitamins	23	4.57%	3	3.22%
Antibiotics	20	3.98%	8	8.60%
Anti-histamines	17	3.38%	13	13.98%
Cardiovascular	17	3.38%	8	8.60%
Antiparasitic	13	2.58%	3	3.22%
Bronchodilator	12	2.38%	2	2.15%
Appetite Stimulant	10	1.99%	0	0
Anorexigenic	9	1.79%	0	0
Contraceptives	8	1.59%	2	2.15%
Analgesics	8	1.59%	4	4.30%
Others [4]	38	7.55%	5	5.37%
Ignored	20	3.98%	-	0

Legenda:

1. The percentages are related to total poisonings reported in the period studied (N = 503)

2. The same pharmacological group can be cited in several cases of this type, generating percentages higher than 100% .
3. The percentages are related to the number of cases of poisoning in which the pharmacological group appeared in association with other groups (93 = 100%).
4. Here are included: lithium, oral hypoglycemic agents, antiemetics, herbal, bisphosphonates, parasympathomimetics, cytostatics, methylphenidate, disulfiram and allopurinol. These, *having been found in a small portion of the notification forms were not included in the table*.

Table 3 highlights that the benzodiazepines, anticonvulsants, antidepressants and neuroleptics were the most frequently used medications, either alone or in association with other drugs. This draws attention to the high prevalence of benzodiazepines recorded in the reported intoxications, this drug is present in 17.5% of the poisonings involving in a medicinal product and 55.91% of poisonings by associations with other medicines. Benzodiazepines are used as sedatives, hypnotics, anticonvulsants, muscle relaxants, coadjutants anesthetics and anxiolytics, and thier wide therapeutic spectrum can collaborate with the large incidence of intoxications involving this class of drugs. Some authors include benzodiazepines, anticonvulsants, antidepressants and neuroleptics in a single class: the neuro-psychiatric drugs. [2,7,15] The prevalence of neuro-psychiatric drugs as main group involved in drug intoxication was also observed in other Brazilian studies, which shows us that the problem of bad use of neuro-psychiatric drugs goes beyond the city limits. [2,7,11.15]

CONCLUSION

The drug intoxications reported at CITOX-PI in the period from 2007 to 2012 occurred predominantly in individuals of the urban area, with a predominance of females in relation to males, being the children and young adults the population most affected. The main circumstances in which occur the poisonings were individual accidents and suicide attempts, and the benzodiazepine class of medicines most involved. Regarding the characteristics of the poisonings it is observed in the results found in relation to the affected population, characteristics of events and pharmacological groups are in agreement with the Brazilian studies on the topic.

Deficiencies were noted with regard to filling in the forms, due to no mandatory registration and lack of uniformity of data in relation to occurrences, where often the fields are not filled in properly, causing data to be underestimated. In addition, there is a reference and counter-reference system between the health services that are requesting aid and the CITOX - PI, which hinders the follow-up of the intoxications and prevents the knowledge of their evolution.

This is a reminder that the processes of human poisoning is becoming one of the most serious public health problems due to lack of control and prevention of poisonings associated with an easy access of the population to a growing number of substances, both licit and illicit with high degree of toxicity. In this scenario, the medicines are listed as responsible for a considerable number of acute intoxication.

Therefore, it is important to know about the drug intoxication profile, in order to observe what the populations are most affected, as well as the circumstances in which they occur these poisonings and the classes of drugs used more, so it is possible for the adoption of policies of education and information of the public and health professionals about the importance and necessity of rational use of medicines.

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